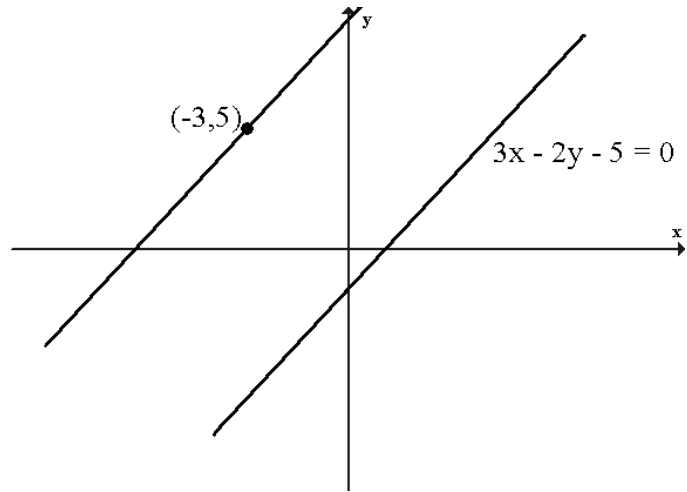


Higher Maths
Supported Study – 4

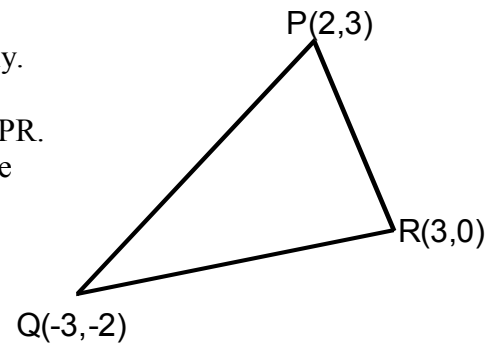
1. Find the equation of the line passing through $(-3,5)$ parallel to the line with equation $3x - 2y - 5 = 0$.



2. The points E and f have coordinates $(2,-5)$ and $(4,a)$ respectively.
Given that the gradient of the line EF is $\frac{2}{3}$, find the value of a.

3. Triangle PQR has vertices $(2,3)$, $(-3,-2)$ and $(3,0)$ respectively.

- (a) Find the equations of the perpendicular bisectors RQ and PR.
(b) Find the coordinates of T, the point of intersection of these two lines.



4. Solve the equation $6\cos^2 x + \cos x = 2$ $0 \leq x \leq 360$

5. $f(x) = \frac{6}{1-x}$ and $g(x) = \frac{x-6}{x}$ $x \neq 0, 1$

- (a) Find a formula for $g(f(x))$.
(b) State the connection between $f(x)$ and $g(x)$.

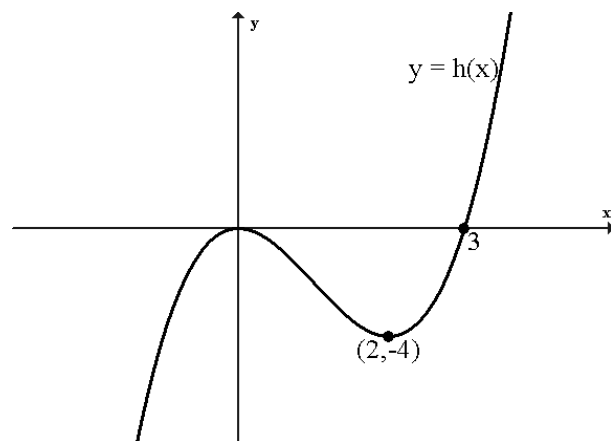
6. Find the equation of the tangent to the curve $y = \frac{x^2 - 12}{\sqrt{x}}$ at the point where $x = 4$.

7. $f(x) = \sqrt{3}x - 1$ and $g(x) = \tan 2x + \sqrt{3}$

- (a) Show that $f(g(x)) = \sqrt{3} \tan 2x + 2$
(b) Hence solve the equation $f(g(x)) = 1$ $0 \leq x \leq 2\pi$

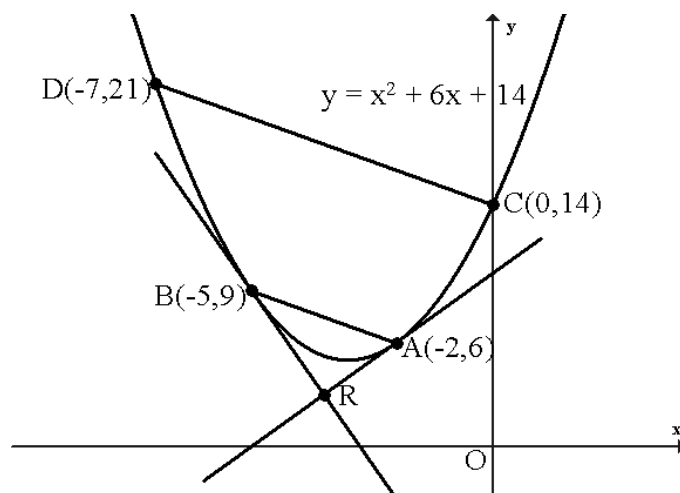
8. The diagram shows the graph of $y = h(x)$

- (a) Sketch the graph of $y = 2 - h(x)$
- (b) Sketch the graph of $y = 3h(x - 2)$



9. The diagram shows a sketch of the parabola with equation $y = x^2 + 6x + 14$ and two parallel chords AB and CD.

- (a) Find the equations of the tangents at $A(-2,6)$ and $B(-5,9)$.
- (b) Hence find the coordinates of R, their point of intersection.
- (c) Let P be the midpoint of AB and Q the midpoint of CD. Show that P, Q and R are collinear.



10. The diagram opposite shows the graph of $y = a \sin bx + c$.

Write down the values of a, b and c.

